IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: Kimmo LAIHO		Atty. Docket No.:	004770.00033
Serial No.:	10/087,437	Group Art Unit:	2684
Filed:	March 2, 2002	Examiner:	Gantt, Alan T.
For:	System and Method for Broadband Digital Broadcasting	Confirmation No.:	3461

DECLARATION UNDER 37 C.F.R. § 1.131

The Honorable Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

We, Kimmo Laiho, Harri Pekonen, and Juha Tomberg, hereby declare that:

1) We are the joint inventors of the above-captioned application;

2) Prior to February 14, 2002, the filing date of U.S. Pat. Appl. Publ. No. 2002/0152107 A1 (hereinafter "Pekonen"), we conceived of the invention recited in claims 1-5, 8, 9, 13-28, 31, 33-41, and 46-51 of the above-captioned application, and diligently pursued constructive reduction to practice in the form of a patent application filed with the United States Patent & Trademark Office.

3) Prior to February 14, 2002, we prepared and submitted an invention report evidencing conception to the Nokia Internal Patent Committee for *Time Slicing Method on DVB-T Mobile Network*, a copy of which is attached as Exhibit A. The dates redacted from the invention report in Exhibit A are prior to February 14, 2002. Other redactions pertain to information irrelevant to establishing a prior date of invention.

4) On February 5, 2002, Brad Wright, our patent attorney at Banner & Witcoff, Ltd., sent a second draft application to our employer for our review. A copy of the email communicating the draft is in the email string attached as Exhibit B. The redacted portion of Exhibit B is an email not referred to in this Declaration.

5) After taking into account suggested revisions provided to our attorneys at Banner & Witcoff, Ltd., on February 19, 2002, Mr. Wright sent a revised draft of the above-captioned patent application to my employer for my review. A copy of the email communicating the revised draft is attached as Exhibit C.

6) Our employer sent subsequent revisions on our behalf to Mr. Wright on February 19, 2002, as evidenced by the email communication attached as Exhibit D.

7) On February 26, 2002, Mr. Wright sent a final draft of the above-captioned patent application to our employer for our review. A copy of the email communicating the final draft is attached as Exhibit E.

8) We reviewed the final draft application and then signed and returned a Joint Declaration for Patent Application on February 28, 2002.

9) On March 2, 2002, the above-captioned patent application was filed in the U.S. Patent and Trademark Office.

10) The submission of our invention reports to the Nokia Internal Patent Committee and exchange of draft applications with my patent attorney demonstrates conception of the invention prior to February 14, 2002, and diligence from a date prior to February 14, 2002, until the filing and constructive reduction to practice of the above-captioned patent application.

11) All acts referred to in this Declaration were performed either in the United States, or in a WTO member country.

12) Except for the above-mentioned redactions, the attached Exhibits have not been altered since they were originally submitted to the Nokia Internal Patent Committee or otherwise prepared or communicated.

13) We declare under penalty of perjury under the law of the United States of America that statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Respectfully submitted,

Kimmo Laiho — Date: 05.01.2005

Harri Pekonen — Date: 10.01.2005

Juha Tornberg — Date: 5-JAN-2005

NOKIA [redacted]

INVENTION REPORT

Title of invention: Time Slicing Method (Client side) on DVB-T Mobile Network	**INVENTION REPORT RECEIVED** Code: 28574 | Patent Committee: NVO/NRC Place: Helsinki | Date: [redacted]
THE DESCRIPTION OF THE INVENTION MUST BE ATTACHED	Signature:

Inventor's name, employee number, title and nationality: *)	Home Address: *)	Business Unit and cost centre:
Kimmo Laiho, 10021234, Senior R&D Engineer, Finnish	Ojarinne 24, 20810 Turku, Finland	Nokia Ventures Organization 1046972
Harri Pekonen, 10031936, Senior R&D Engineer, Finnish	Upalingontie 64, 21260 Raisio, Finland	Nokia Ventures Organization 1046972
Juha Tornberg, 10032700, Senior R&D Engineer, Finnish	Honkatie 27, 20540 Turku, Finland	Nokia Ventures Organization 1046972

Line Manager(s):
Jarmo Kuusisto

Project : *) Gallipoli, 100630967 | Project Manager: Stuart Ravenscroft

Office address: *) Joukahaisenkatu 1, FIN-20520 Turku

Phone: *) +358 7180 33253 | Fax: *) +358 7180 33222

The invention becomes public on: xxxxxxxxx

I am/ We are the sole/ and original inventor(s) of this invention.

The company may, by virtue of applicable legislation, be entitled to full or partial rights to the invention. I/ We acknowledge my/ our obligation to sign as inventor(s) all documents that may be required for protecting the invention in different countries.

Applicable to inventions made by inventors employed in FI, DK, DE and SE only.

Unless the inventor requests the Invention Report to be responded to within four (4) months from the date this Invention Report is received or such other period as the mandatory provisions of the applicable local law may otherwise require, the inventor consents to the right of the employer to use a reasonable period of time for the evaluation of the invention. A reasonable period of time may exceed four (4) months.

☐ *I/ We request that the Invention Report be responded to within four (4) months.*

Date:
Signature(s) of Inventor(s):

*) See the instructions

I have read and understood the invention described in this Invention Report

Date:
Signature of Manager

NOKIA

[redacted]

INSTRUCTIONS FOR COMPLETING THE INVENTION REPORT

This Invention Report form is used in cases where an invention has been made by an employee of the Company. This Invention Report is confidential. Only the Patent Department may make copies of signed Invention Reports in order to request opinions or reply to the inventor(s).

The inventor completes the Invention Report and the description of the invention. The inventor does not fill in the 'Invention Report received' field. This field is filled in by the Patent Department. The Invention Report must have the names of all the inventors and their home addresses. If there is not enough space for all the names, addresses etc, please write them on a separate attachment. The first mentioned inventor is assumed to be the contact person in matters concerning the Invention Report. In the fields of office address, phone and fax, please fill in the contact person's information. Fill in the project field, if the invention is made in a project. The original Invention Report is signed by all inventors. Each page of the original Invention Report is signed by a Manager. In case it is difficult to obtain Manager's signature your Patent Department will take care of it.

It is suggested that the Invention Report and the description of the invention should be filled in as thoroughly as possible. If drawings or other kind of information cannot be attached to this form, they should be delivered separately.

The signed Invention Report is given directly to the local or business unit's Patent Department. Invention Report should also be sent by E-mail to the Patent Department. The Patent Engineer will inform the inventor of receiving the Invention Report. The Patent Engineer will obtain any expert opinions needed to properly evaluate the invention, will procure the Company's decision and inform the inventor accordingly.

I have read and understood the invention described in this Invention Report

Date:
Signature of Manager

NOKIA [redacted]

DESCRIPTION OF THE INVENTION

Please, describe your invention in the following order. You can enclose the drawings on a separate document.

1. Field and background of the invention

Invention was made in Gallipoli project when defining how Client (DVB-T Receiver) power consumption could be reduced with Time-Slicing method in the DVB-T Mobile Network. Time-Slicing method is basically TDM meaning that receiver can be shut down unless nothing is being received and activated when needed.

2. A summary of the invention

Invention describes a solution to the Client end how to be able to optimise the power ON time (to reduce client power consumption). This invention gives an idea how the timing between bursts can be defined or known by the receiver side. This invention report is actually part of the similar invention report on network.

3. Describe the problem which the invention overcomes

The main problem is, that power consumption of IPDC client device has to be reduced, and with current technology power consumption of DVB-T front end is too high.

4. How was the problem solved earlier?

So far no Time-Slicing or similar method has been used in DVB-T Network (neither DVB-T mobile services nor networks available)..

5. How does the invention improve earlier solutions? Advantages and disadvantages of the invention?

No earlier solutions.
With this new solution the client will be able to shut down the DVB-T receiver unless requested services are being received. This will reduce the power consumption. This feature is particularly efficient in streaming services.

6. Brief description of the drawings (Please enclose drawings and figures of the invention on a separate document)

Picture 1. Block diagram of the Elastic Buffering

This picture gives an idea how the Client side Elastic Buffer can work with the FIFO flags. (Filling and emptying of the FIFO is described in the graph).

The Elastic buffer can also be understood as Burst Buffer. One such buffer is needed by service (also here on client side).

7. A more detailed description of the invention (if known at the moment)

The client should be able to shut down the DVB-T receiver unless requested services are being received. The idea is to use Time-Slicing (/TDM), which means that on the network

side all services are constructed in such form that the client can receive the services in big bursts (with as large transmission path capacity as possible) and shut down the receiver between the bursts.

The size of bursts can be different for different services and client can also handle the services without bursts, but then of course power consumption can't be reduced (in practise receiver has to be on all the time). For one service the burst size can be fixed or vary slowly, so that with burst size averaging (measuring of incoming burst sizes) the receiver can adapt to slow burst size variations.

Client handles the bursts with a programmable-size (or fixed-size) Elastic Buffer (a FIFO), which has programmable (or fixed) Almost Full and Almost Empty flags. No control info has to be (but can be) exchanged between Client and Network. The Client can adapt to the fixed burst size (amount of fixed size packets) and thus adjust the size of the Elastic Buffer and also to set the control flags. The Elastic Buffer of the network side has the same size.

When Client is feeding the service to user application, which consumes the content, the Elastic Buffer mechanism will indicate by an "Almost Empty" flag to the Client to turn the DVB-T receiver on again and to be prepared to receive the next burst. Client has to program "Almost Empty" flag so that it takes care of all delays (for example bit rate adaptation, receiver switch-on time, acquisition time etc.) needed to get the DVB-T receiver ready to receive the next bursts. The "Almost Full" flag will be used to shut down the DVB-T receiver.

This method does not require return path for client to communicate with network - all information related to this method can be transferred from network to client only if needed.

8. Explain, how the invention is/can be implemented. Which would be the best mode of implementation?

The Elastic Buffer can be an integrated or an external memory of the Client or DVB-T receiver.

The Elastic Buffer can be structured as FIFO, ring buffer, or dual buffer with separate input and output sections.

9. Explain how we can recognise if a competitor is using the same product/feature?

If the client can switch off the receiver every now and then when receiving streaming services, then it most probably uses this method.

10. Is it planned to use the invention in a Nokia product? If so, when and in which product? Is the invention standard related?

This idea could be used to implement the TimeSlicing/TDM method in future DVB-T mobile networks and clients.

11. Abbreviations

CPU	Central Processing Unit
DVB	Digital Video Broadcasting
FIFO	First In First Out (memory type)
TDM	Time Division Multiplexing

I have read and understood the invention described in this Invention Report

Date:
Signature of Manager

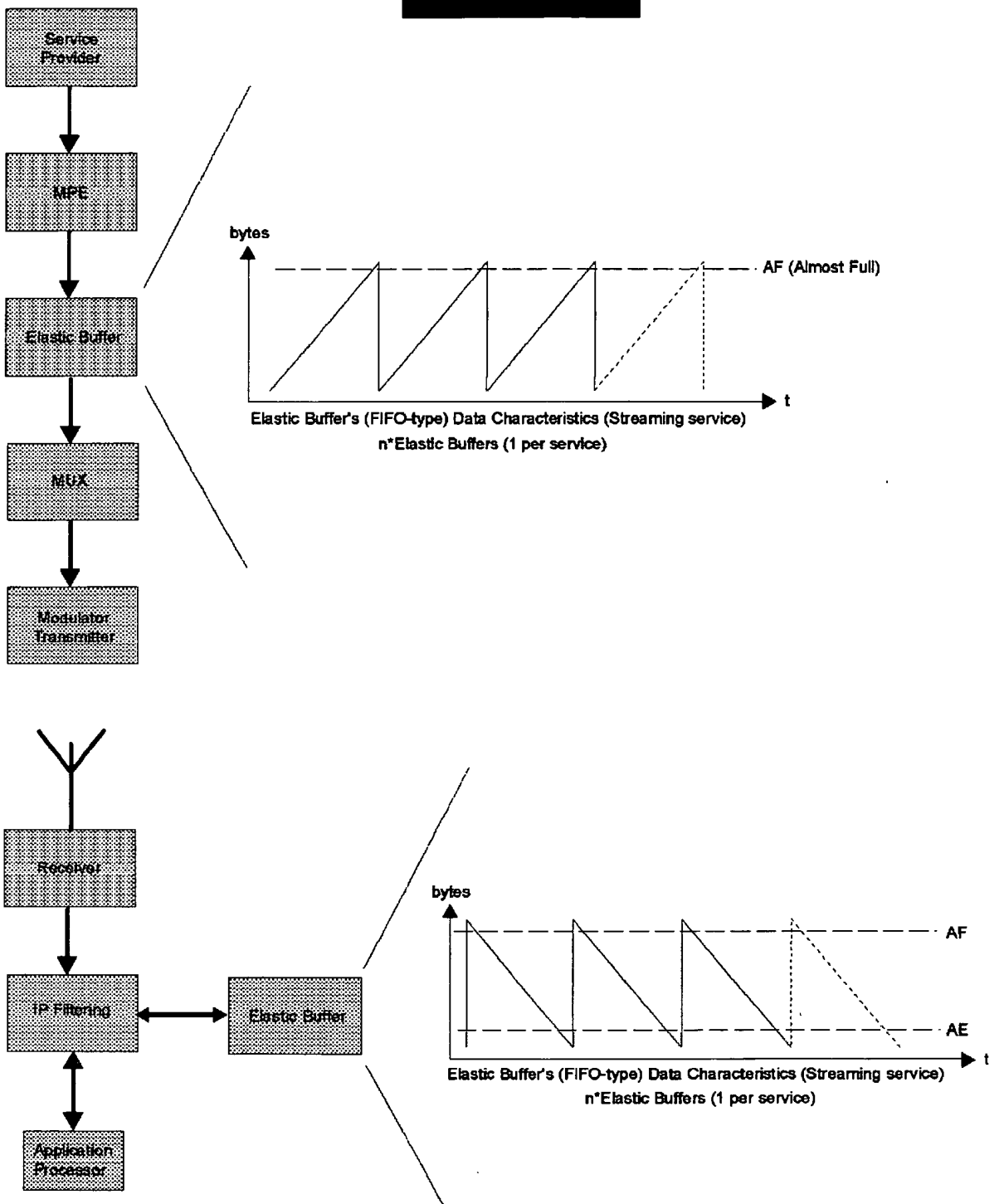
NOKIA

[redacted]

12. Any further comments

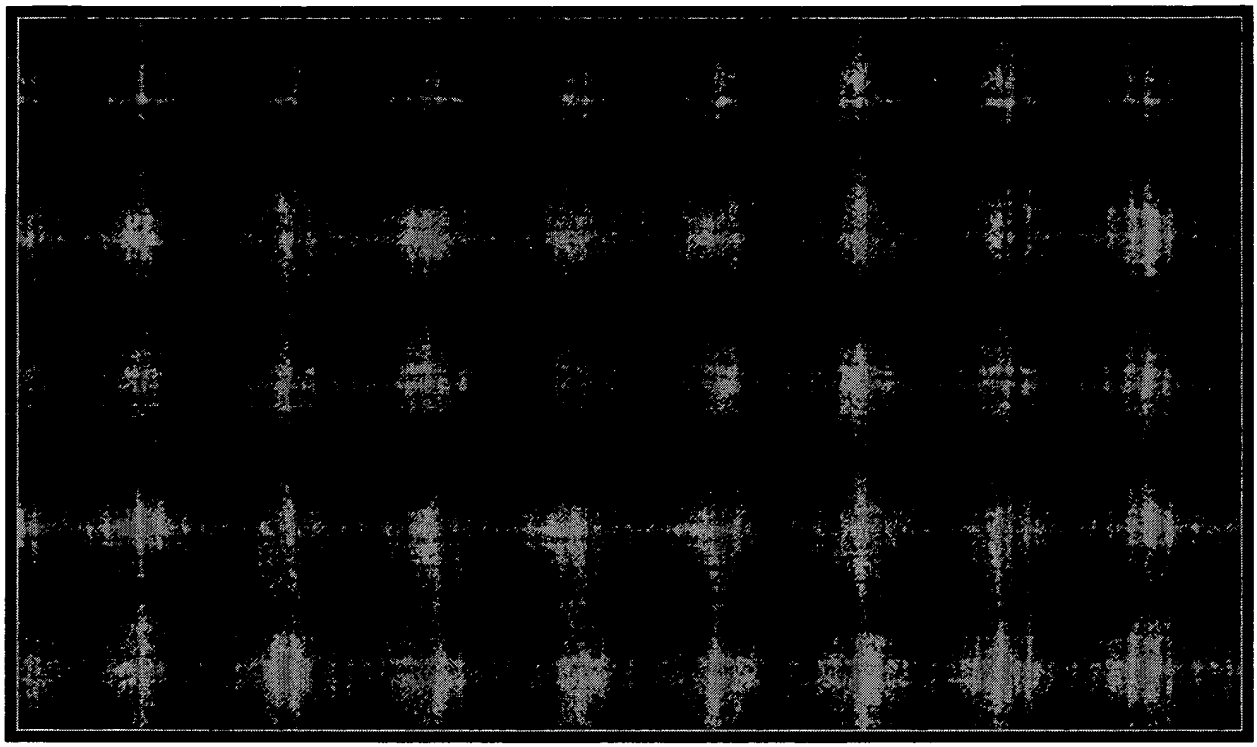
I have read and understood the invention described in this Invention Report

Date:
Signature of Manager



Picture 1. Block diagram of the Elastic Buffering

I have read and understood the invention described in this Invention Report Date: Signature of Manager	6



-----Original Message-----
From: Patent-Agency Banner-Witcoff (EXT-RES/Washington)
Sent: 05 February, 2002 16:37
To: Aarnio Ari (NVO/Helsinki)
Subject: Re: Second Draft of Nokia NC28574,-5,-6/004770.00033

Ari, attached is a second draft of the above-identified patent application, along with declaration and assignment. Although this is in nearly final form, Joe Stecewycz has embedded a couple of comments to the inventors in this draft that require response before we can file the application. We look forward to receiving responses to these comments before filing.

Best regards, Brad

IMAN_BST_78194_1_commented.DOC

CC: Pease, Pamela Beth

From: Bradley Wright
To: Stecewycz, Joseph
Date: 2/19/02 8:28AM
Subject: for the file and Nokia status chart

From: Patent-Agency Banner-Witcoff (EXT-RES/Washington)
To: Aarnio Ari (NVO/Helsinki)
Cc:

Subject: Final Draft of NC28574/75/76 (our 4770.00033)
Sent: 2/19/02 3:21 PM
Importance: Normal

Ari, attached is a final draft of the above-identified patent application, including formal documents, from Joe Stecewycz. Joe has incorporated the additional comments received from the inventors. If everything is in order, please have the inventors sign these papers and return to us for filing.

Best regards, Brad

78194_2.doc Figs_1_11_0033.PDF IMAN_BST_78181_1.DOC IMAN_BST_78195_1.DOC

CC: Pease, Pamela Beth

From: Bradley Wright
To: Stecewycz, Joseph
Date: 2/26/02 1:54PM
Subject: another revision

Joe, please revise as soon as possible and return with formal documents.

Thanks, Brad

From: Aarnio Ari (NVO/Helsinki)
To: Patent-Agency Banner-Witcoff (EXT-RES/Washington)
Cc:

Subject: FW: Final Draft of NC28574/75/76 (our 4770.00033)
Sent: 2/26/02 4:46 PM
Importance: Normal

Brad,

Please find enclosed the enclosure with amendments.

BR Ari
-----Original Message-----
From: Patent-Agency Banner-Witcoff (EXT-RES/Washington)
Sent: 19 February, 2002 15:21
To: Aarnio Ari (NVO/Helsinki)
Subject: Final Draft of NC28574/75/76 (our 4770.00033)

78194_2.doc

CC: bherd

From: Bradley Wright
To: Stecewycz, Joseph
Date: 2/26/02 5:37PM
Subject: for the file/status chart

From: Patent-Agency Banner-Witcoff (EXT-RES/Washington)
To: Aarnio Ari (NVO/Helsinki)
Cc:

Subject: Final Draft of NC 28574,-75,-76/our 4770.00033
Sent: 2/27/02 12:13 AM
Importance: Normal

Ari, attached from Joe Stecewycz is a final draft of this application, including formal documents. This includes the final revisions we received from you earlier today.

If everything is in order please have the inventors sign and we will prepare for filing.

Best regards, Brad

Figs_1_11_0033.PDF IMAN_BST_78181_1.DOC IMAN_BST_78194_3.DOC IMAN_BST_78195_1.DOC

CC: Herd, Brenda